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FOOD & AGRICULTURE

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VINEYARDS INTEGRATED
SMART CLIMATE APPLICATION

Applications of Remote Sensing ET mapping for climate change adaptation in Viticulture

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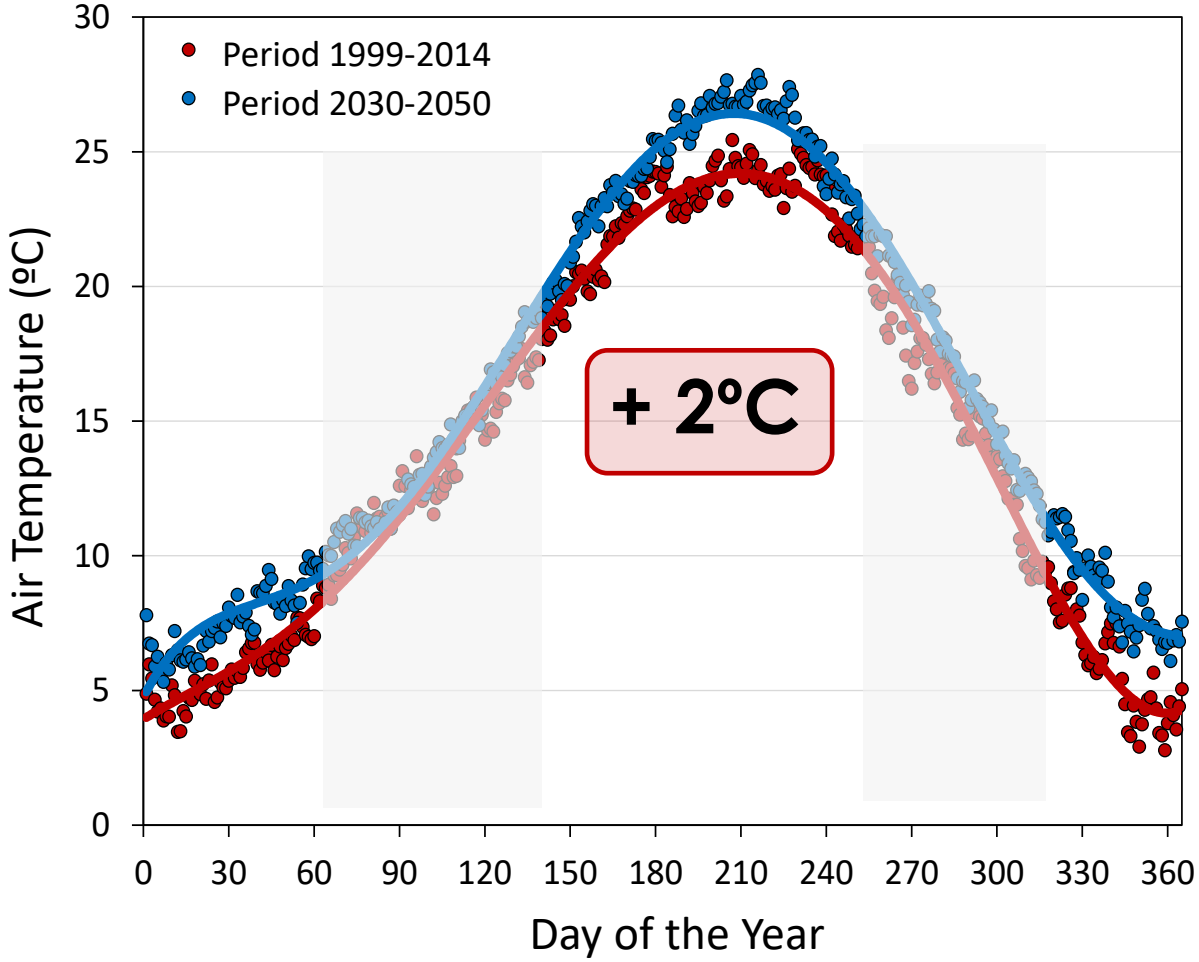
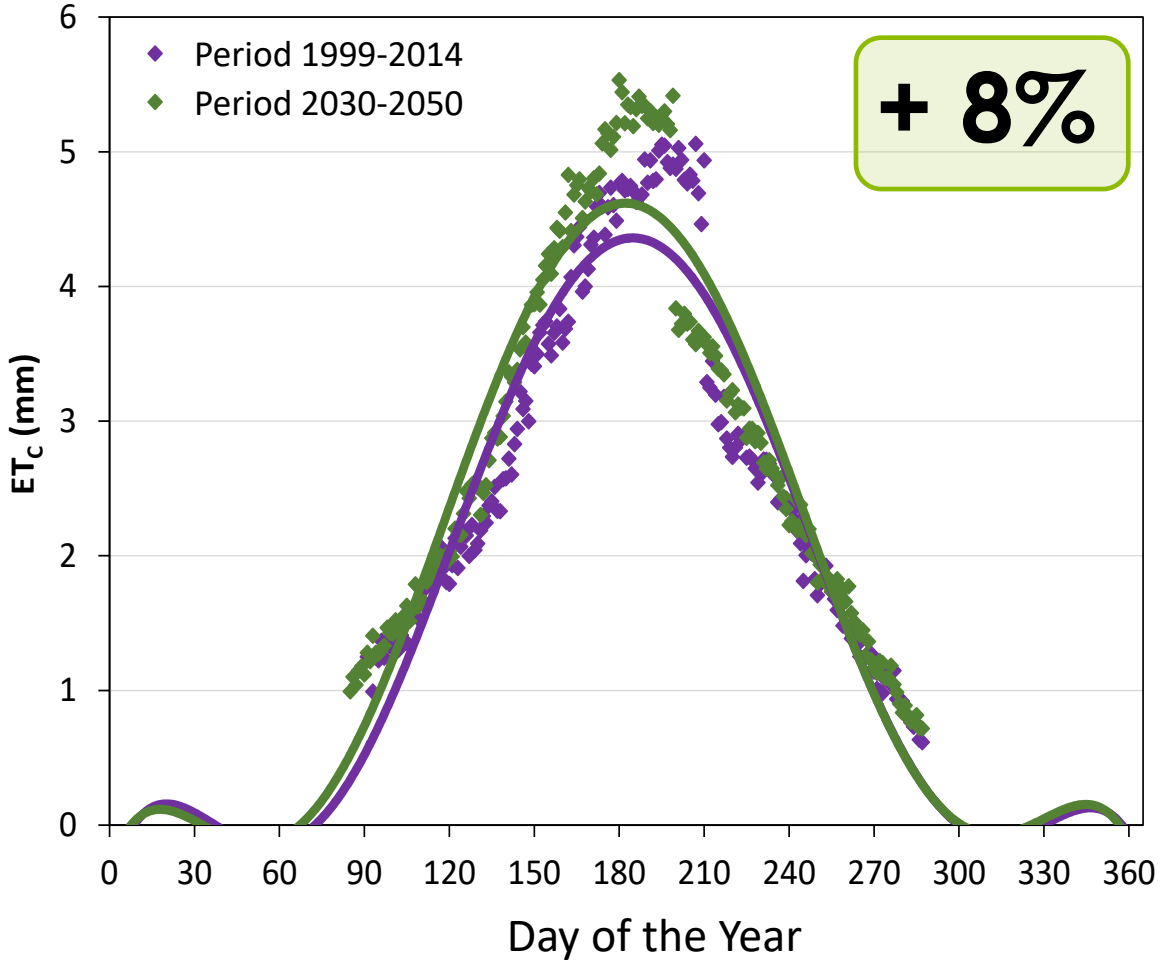
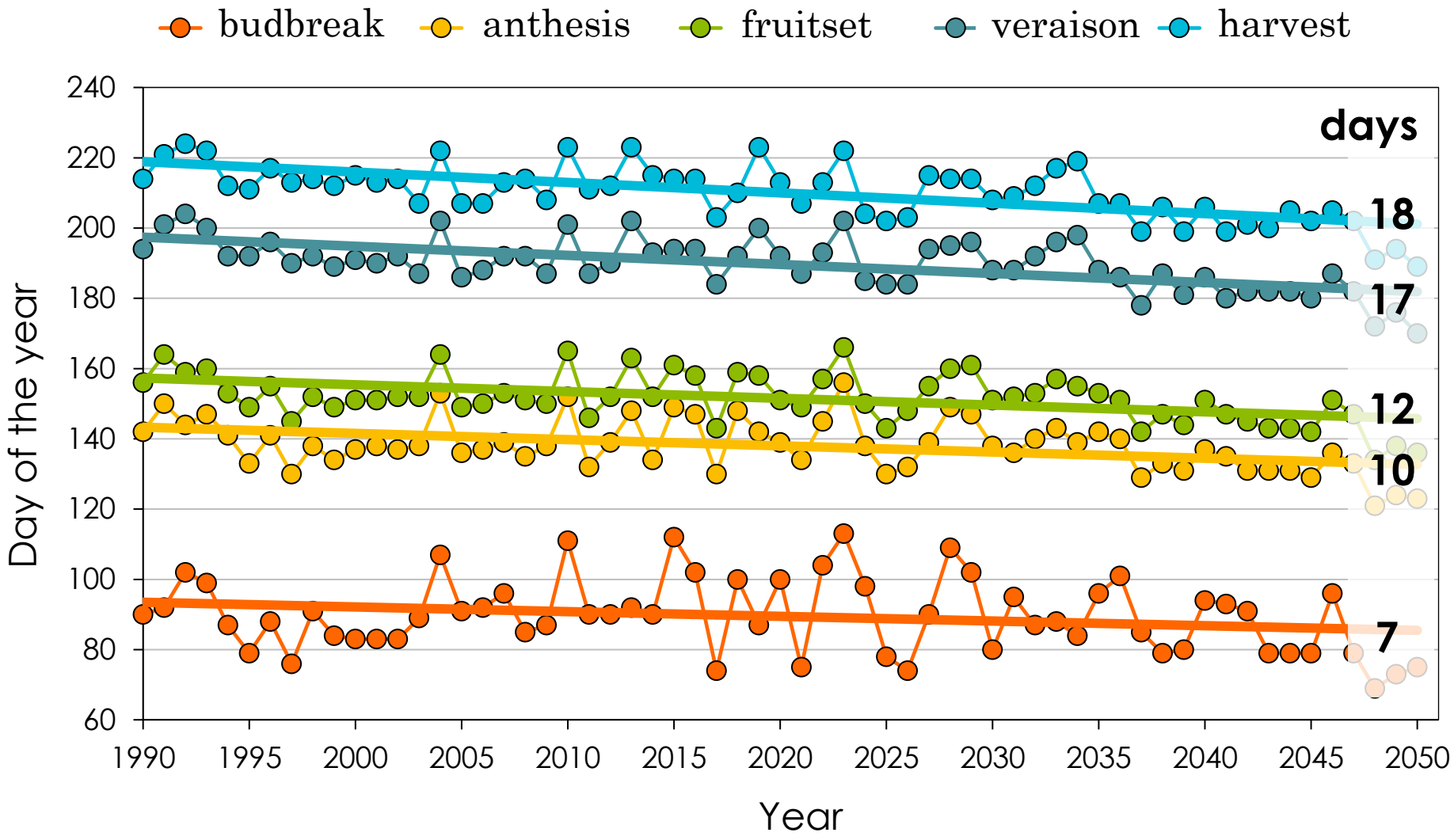
Global warming will have an impact on grape physiology, water requirements and yield





Raimat, Catalonia

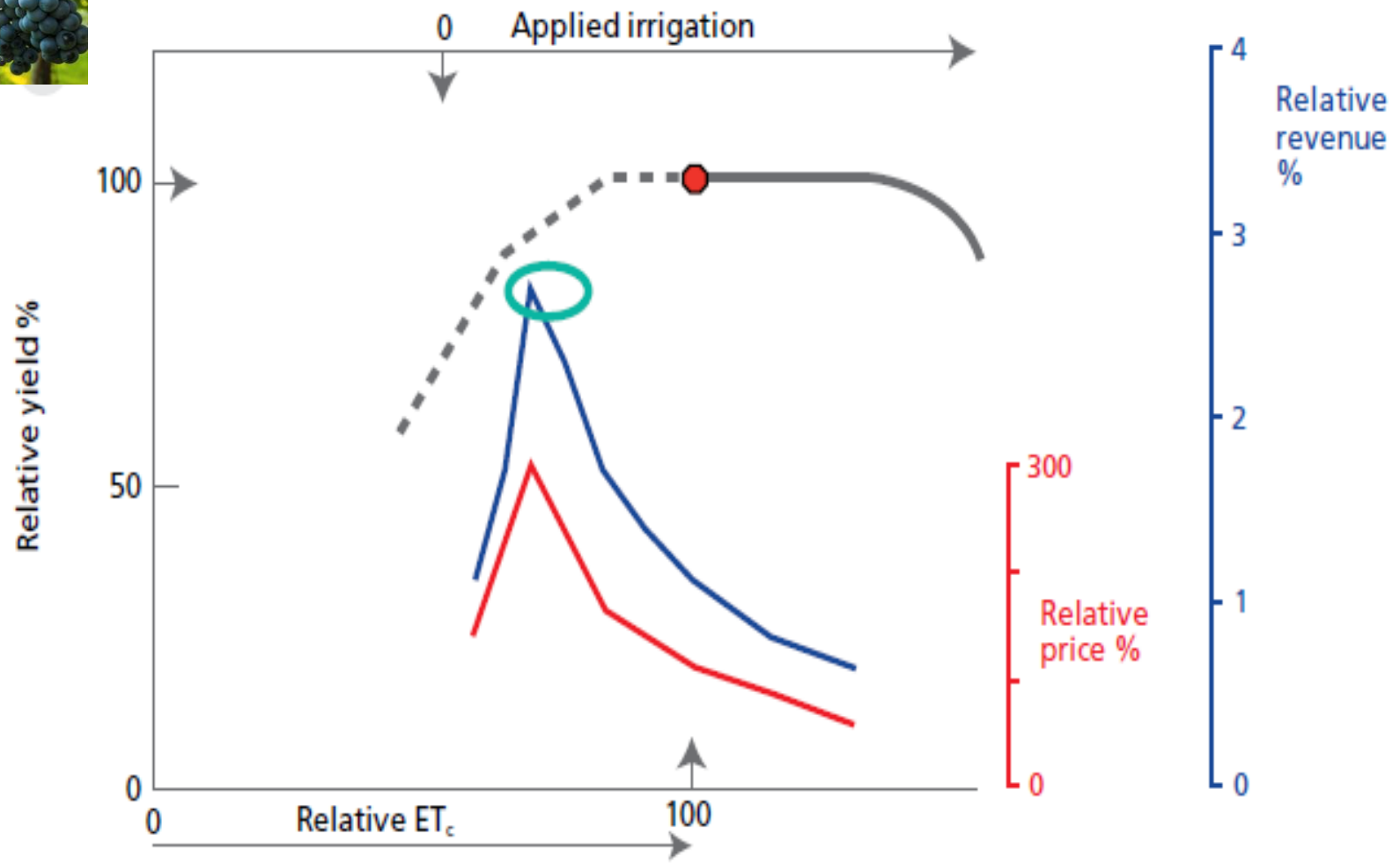
Phenological predictions



Raimat, Catalonia

What to do in Viticulture?

- Drought resistant plant material (variety, rootstock …)
- Modifying training systems (wider row spacing) and viticultural techniques (e.g. trunk height, leaf area to fruit weight ratio, crop-forcing …)
- Move to cooler regions
- Improve irrigation efficiency


0
Applied irrigation
100
50
0
Relative yield %
0
Relative ETc
100
300
0
Relative price %
4
3
2
1
0
Relative revenue %

FAO 66 (2012)

Copernicus
Europe's eyes on Earth

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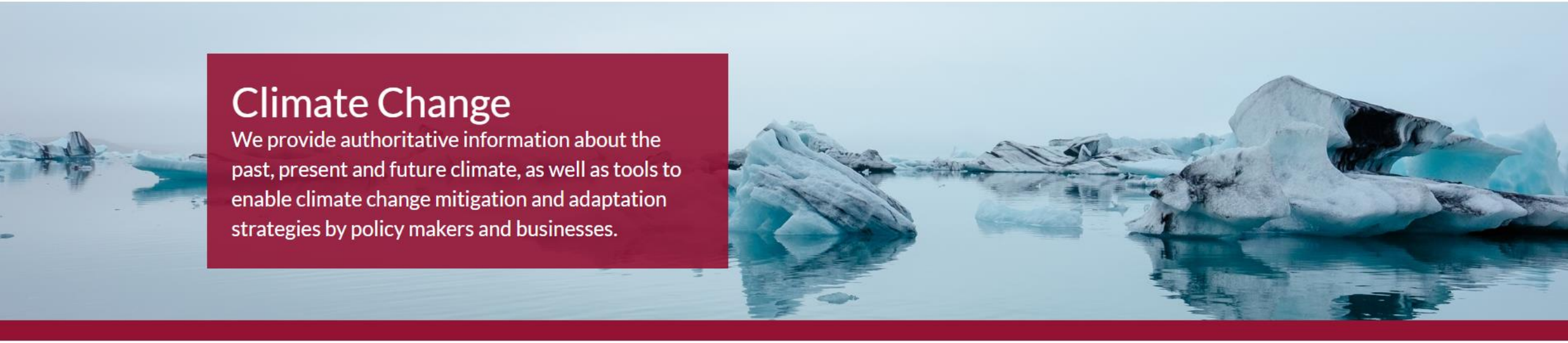
Copernicus Services

Climate Change Service



•The Copernicus Climate Change Service (C3S) is working to support the sector. C3S, which is implemented by the European Centre for Medium-Range Weather Forecasts (ECMWF) on behalf of the EU, is overseeing the development of a Sectoral Information System (SIS) for Global Agriculture that will provide data and tools to help crop researchers, international policymakers and agricultural consultancies to adapt to climate change and increasing climate variability.

SENTINELS FOR EVAPOTRANSPIRATION

sen-et
sentinels for evapotranspiration

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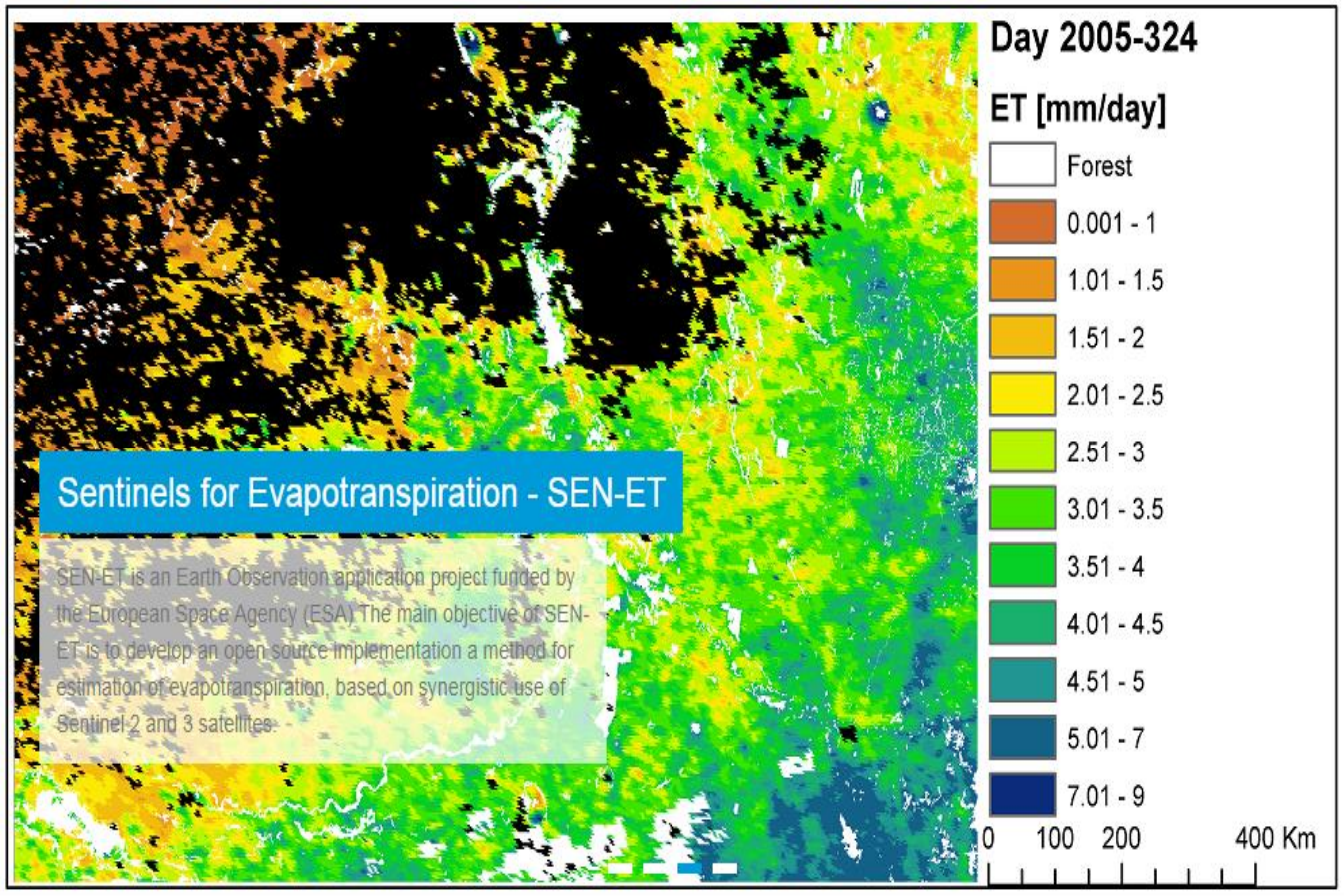
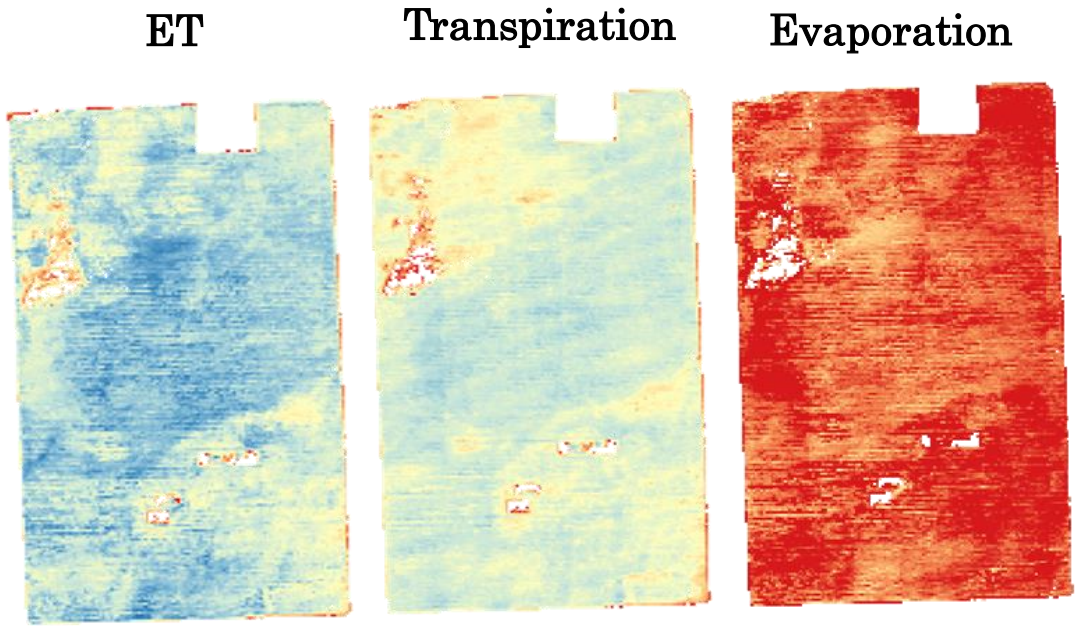
www.esa-sen4et.org





esa
DHI GRAS
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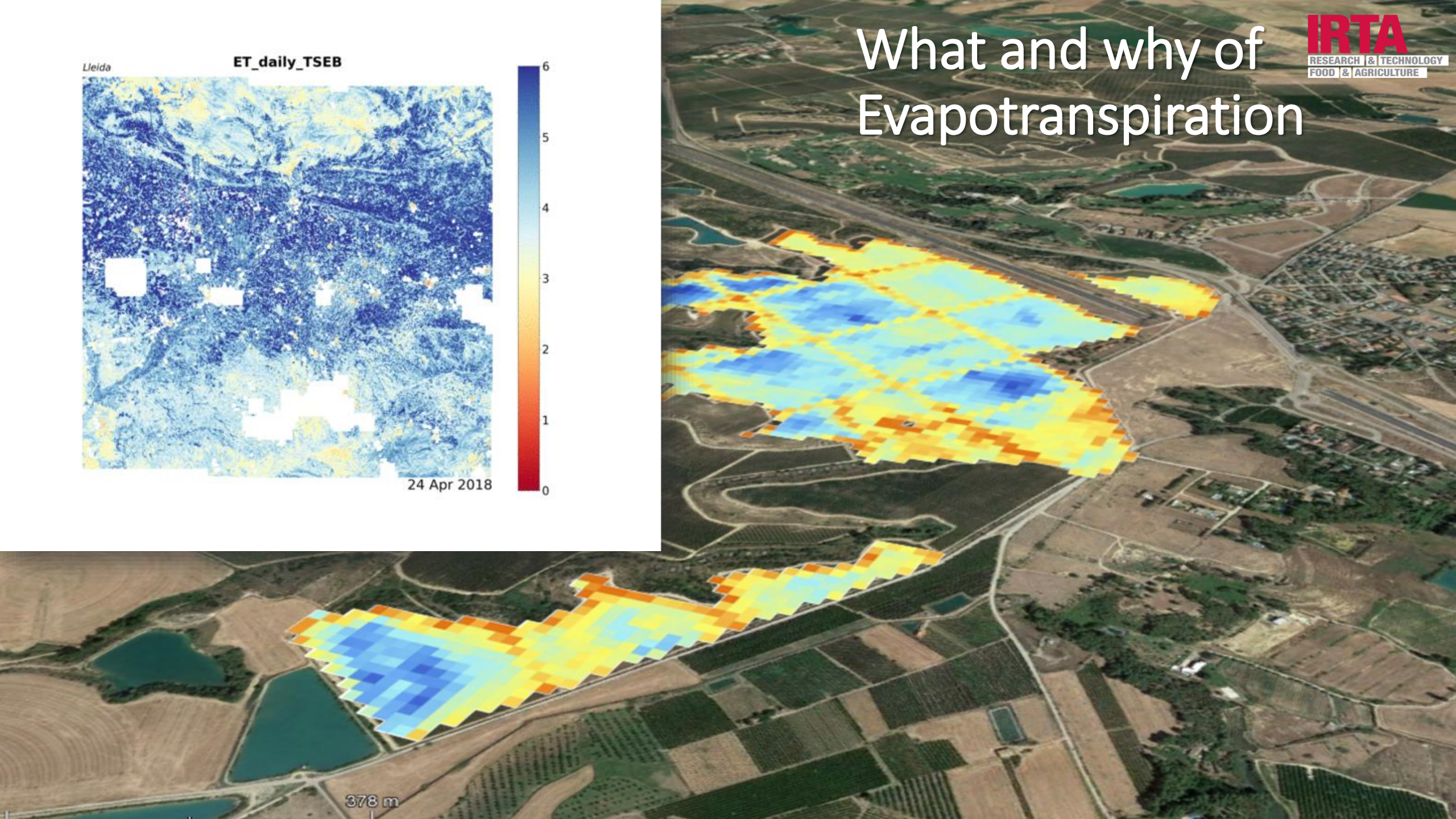
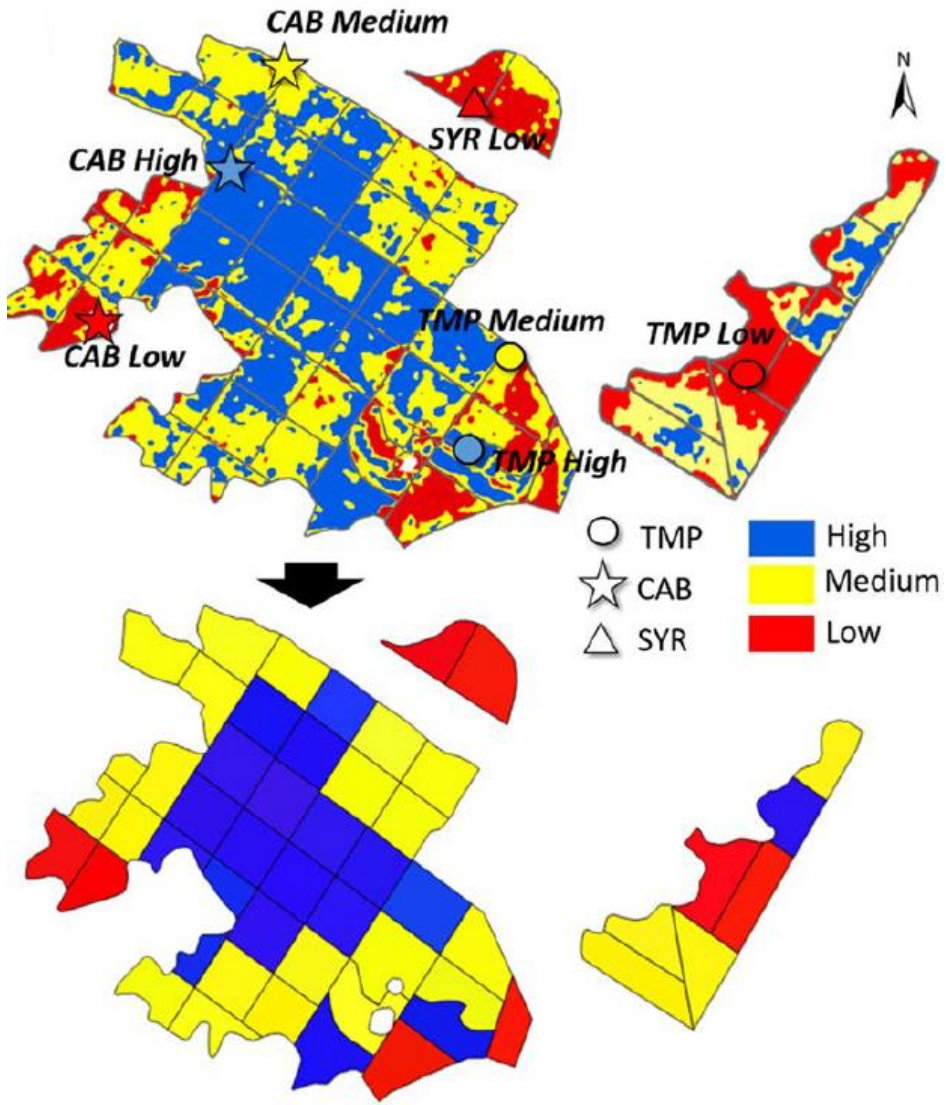
Sandholt

What and why of Evapotranspiration



IS PRECISION IRRIGATION ECONOMICALLY VIABLE?



100-ha vineyard with 3 varieties

Year	Conventional (hm^3)	PI (hm^3)	Water savings
2016	0.39	0.28	-28%
2017	0.40	0.26	-35%

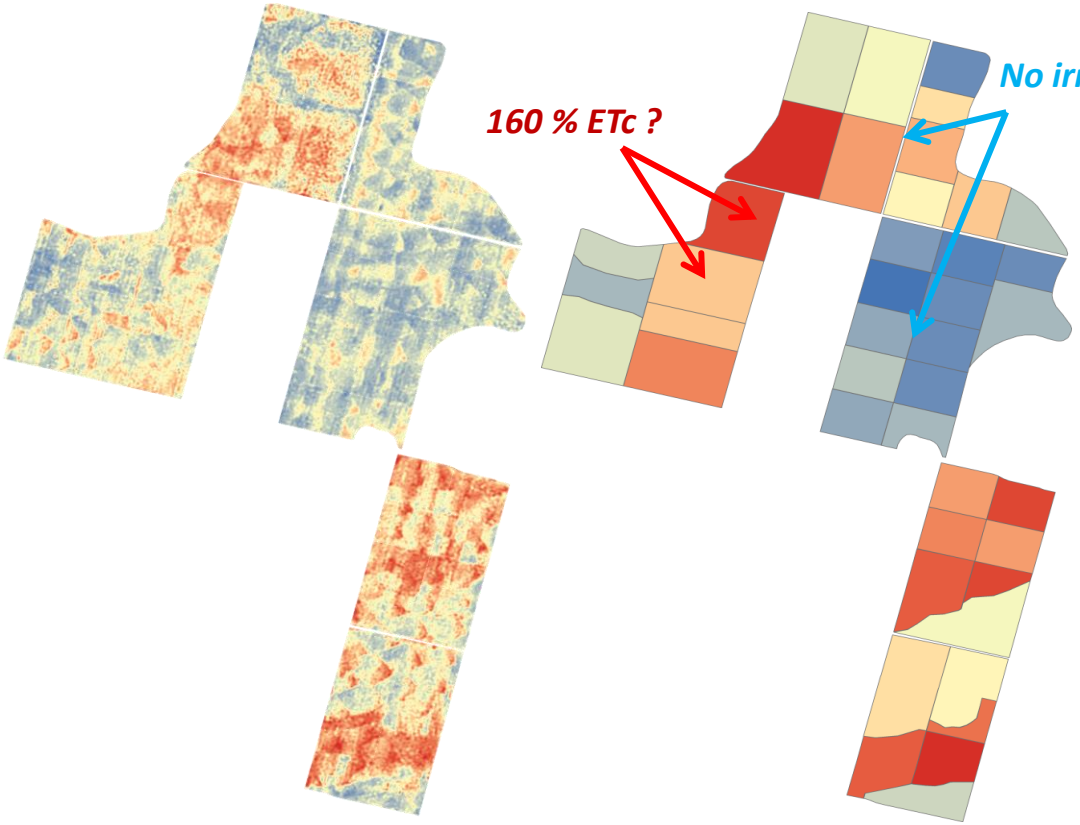
PI Costs: 5090 Euros
Saved in 2016: 7090 Euros
Saved in 2017: 9960 Euros

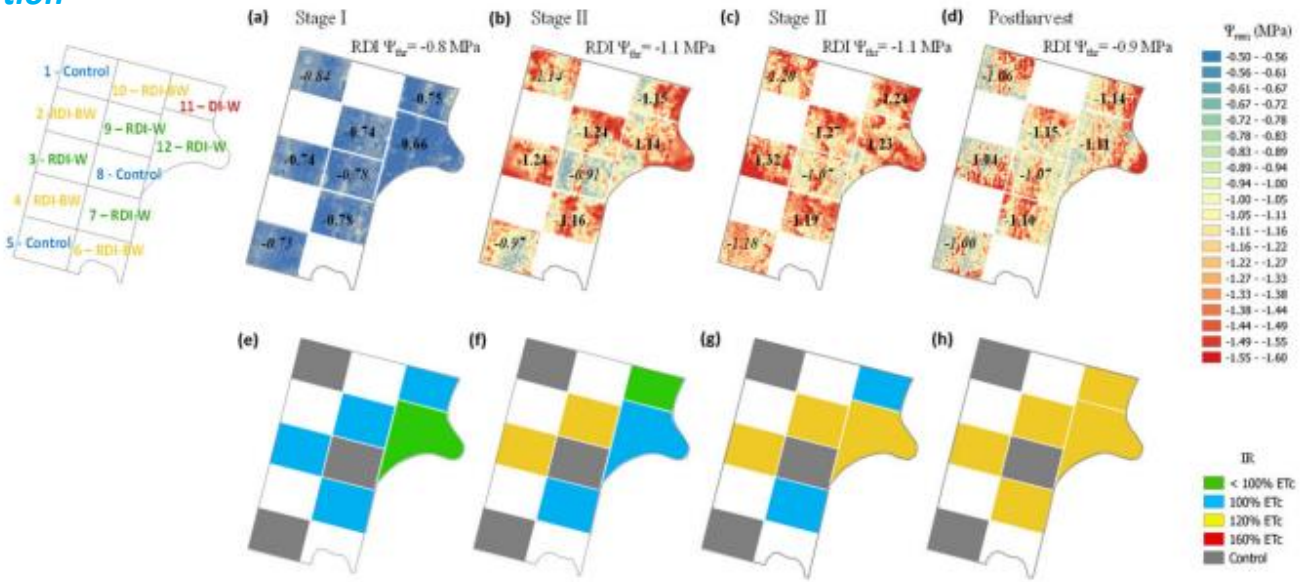
PI value in this case: 20-48 Euros/ha savings
SITE SPECIFICITY !!

Bellvert et al. (2020)

IN THE PAST …

Ψ_{leaf} maps at irrigation sector level

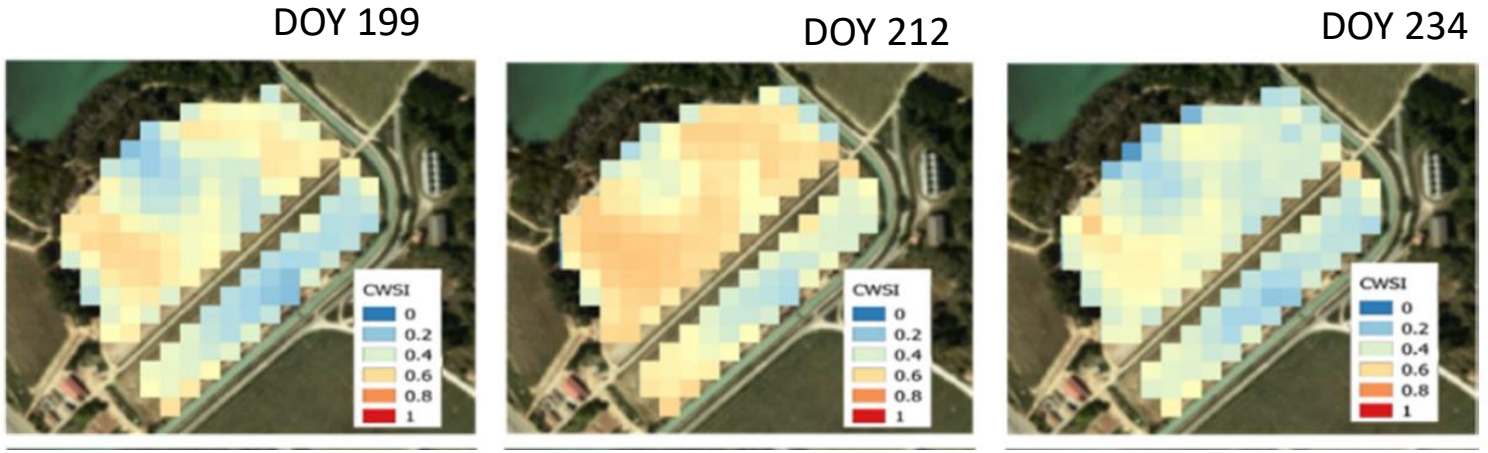


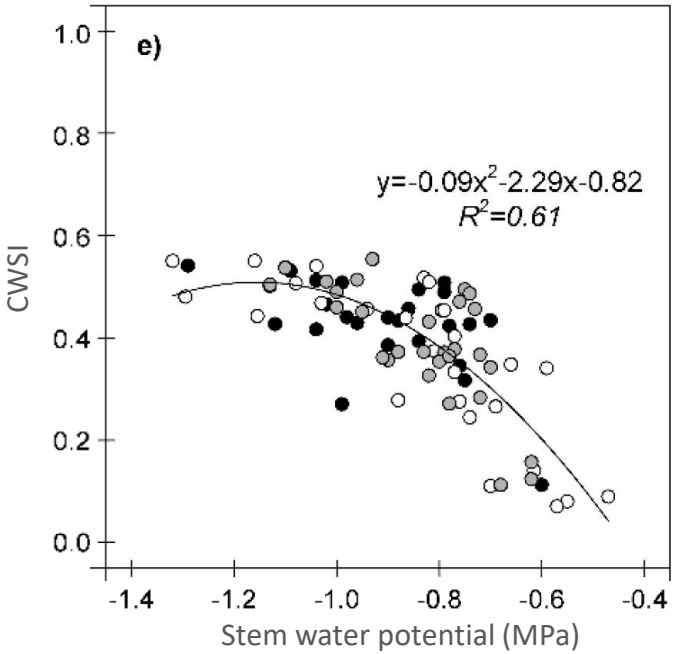


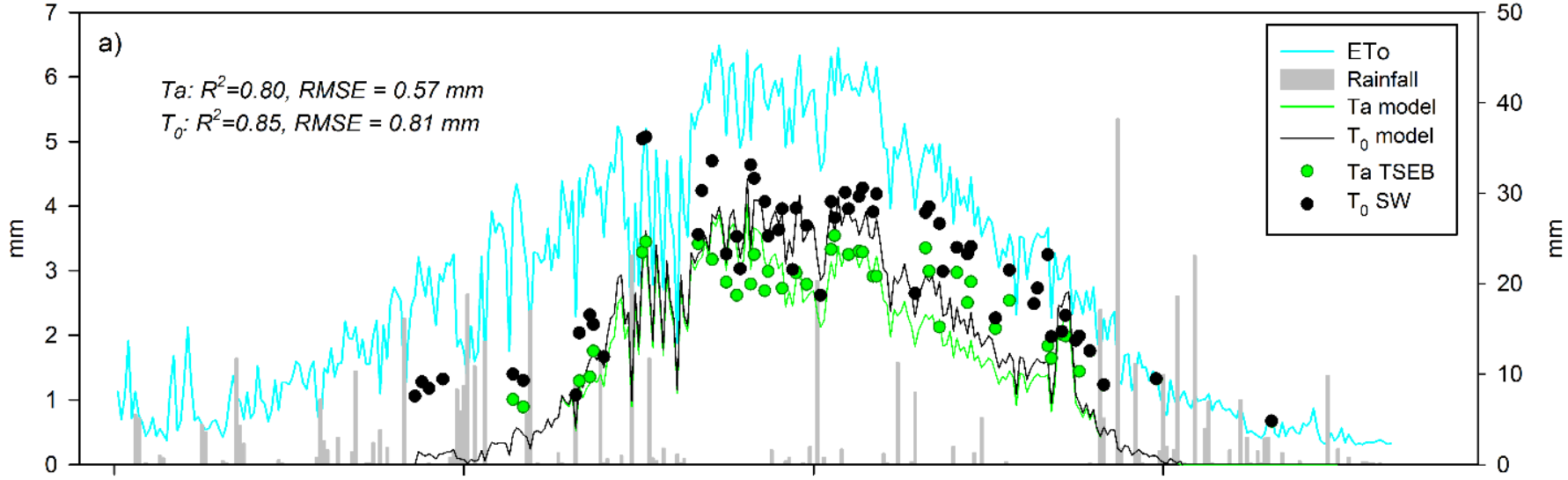
Bellvert et al. (2016)

Best paper award AJVO (2016)

Novel advances in Remote Sensing for ET and water status

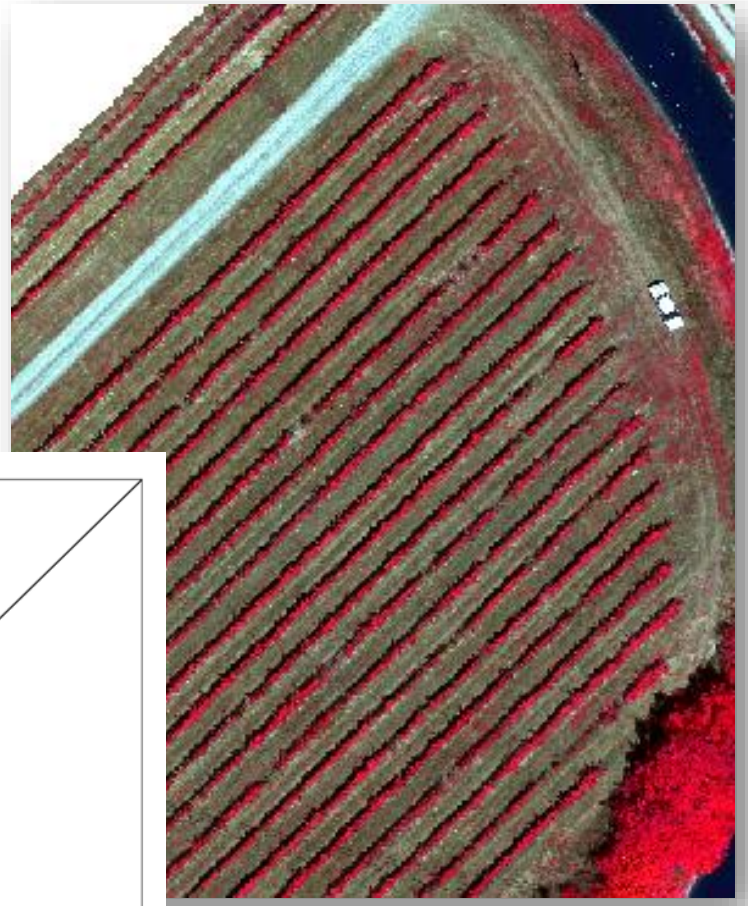


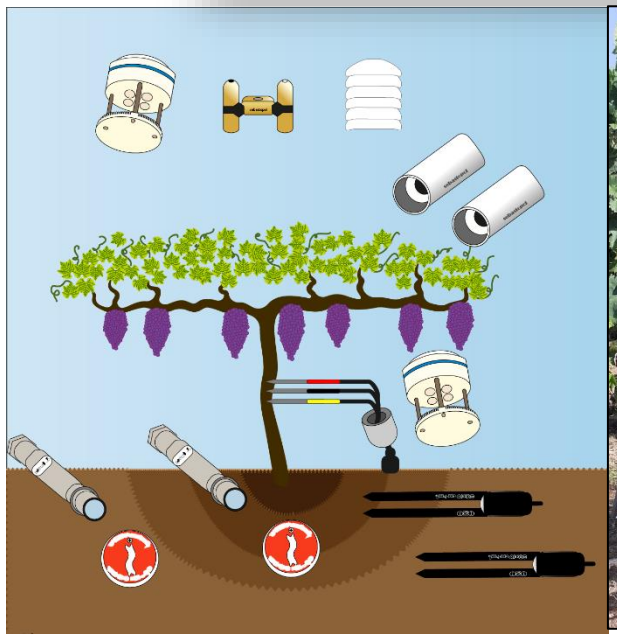


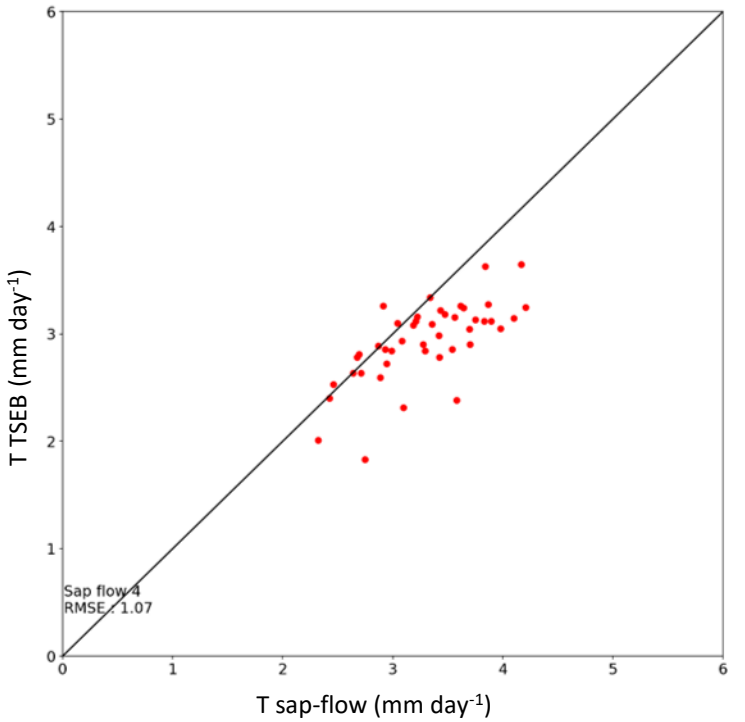


Bellvert et al. (2020)

Novel advances in Remote Sensing for ET and water status

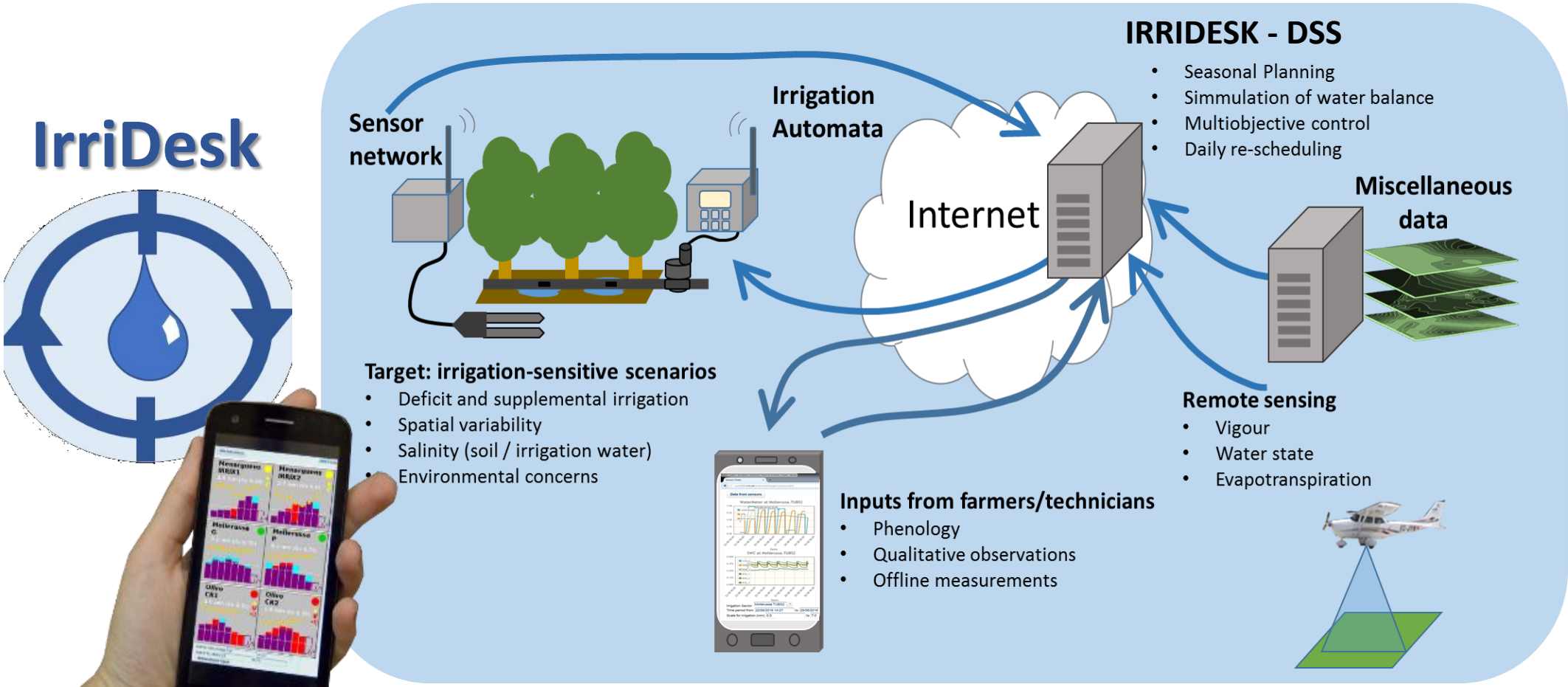




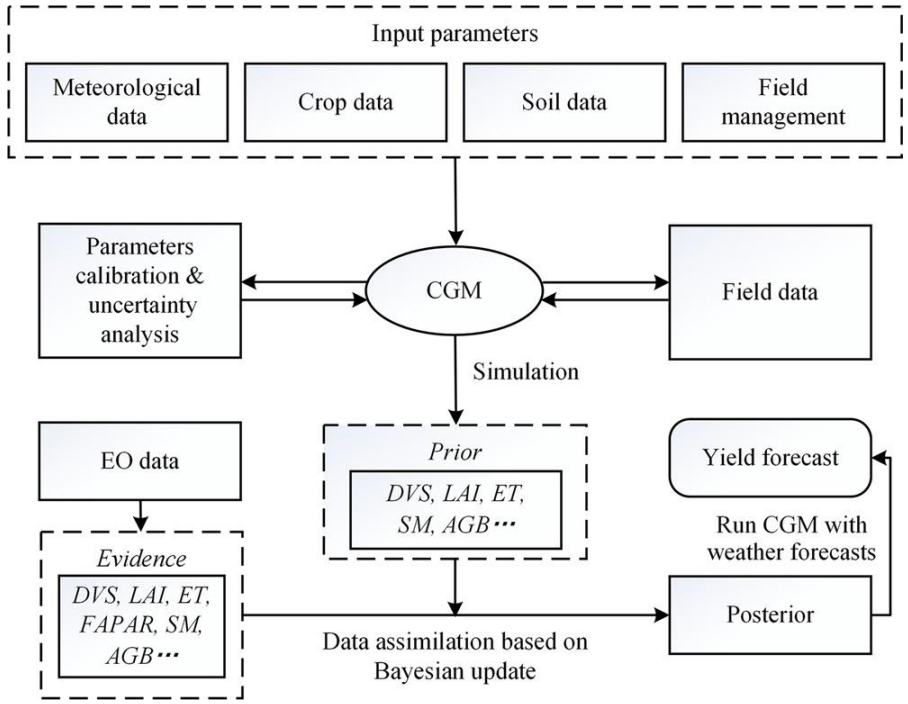


THE CHALLENGE ……

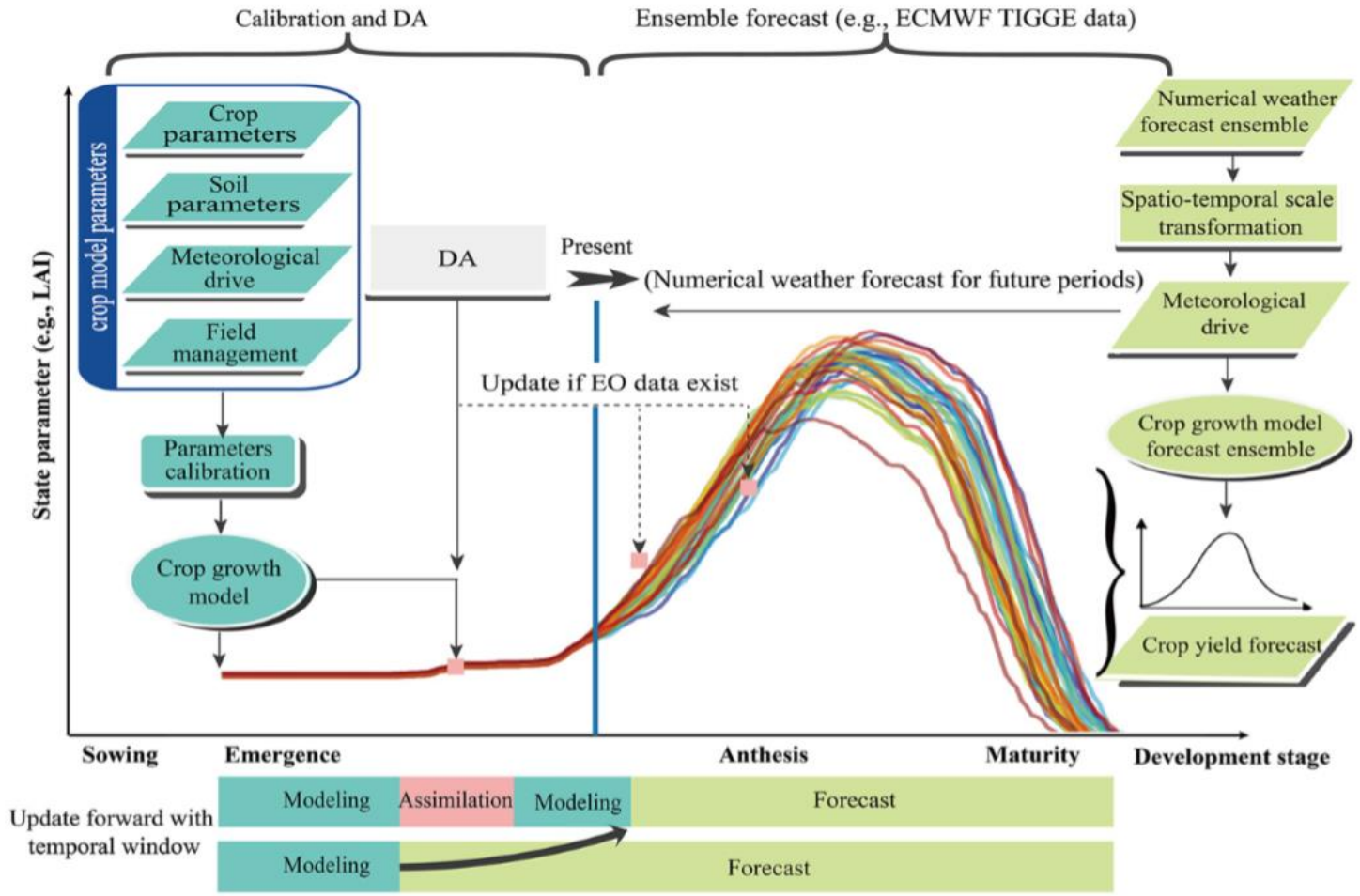
Currently there are applications to conduct precision irrigation --- IRRIDESK



Data Assimilation



Schematic representation of a typical DA system



DA with numerical weather forecast

Huang et al. (2019)

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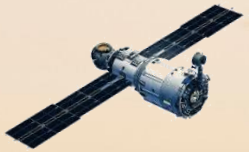

Thanks for your attention!

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